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Submitted for consideration of the LETSI community.

Learning, education, and HR standards communities have very little to show in terms of cross-domain standards interoperability and convergence despite significant investments over a period of more than a decade.

Constructive liaison between standards organizations that produces tangible results is very challenging. Often convergence and interoperability initiatives are scoped too broadly. Instead of taking on broad topics as areas for convergence, a more constructive idea is for standards organizations to commit to the creation of a small set of lower-level core data types. Another common problem is that liaison between standards organizations almost always fails when framed as "convergence" between two standards.

In developing the next generation of SCORM standards, I urge LETSI to work with other standards stakeholders on a narrowly scoped project aimed at developing a small set of neutral core components that each organization could draw upon as their time lines and priorities dictated.

UN/CEFACT provides the methodologies and neutral turf where this work might be achieved. Resources are thin across the standards community, but I believe a small amount of attention to a handful of common components could have a big payoff. As an example, I've provided a discussion draft related to one such component proposed to go into HR-XML's forthcoming version 3.0 library. This has been submitted for the consideration by UN/CEFACT's core data type catalogue committee.

Thanks in advance for consideration of this request.

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Candidate Paper: Addition of Score Data Type

Responsible Person (Contributor)

Contributor:[1]	Chuck Allen	**Date:**[2]	22-Jul-2008
Standard Organization:[3]	HR-XML	**Project Group:**[4]	ATG2

Details of Issue

Name of new CDT or extension[5] Score. Type
Issue:[6] Add new Core Data Type 'Score. Type'
Definition:[7] A numerical record of the marks allotted to individuals in the measurement of abilities, capacity to learn, in

the assessment of personality, or in other measurable characteristics (e.g., credit worthiness).

More specifically, within the HR processes, a score can include:

- The numerical result of a test or evaluation process (simulation, appraisal, observation, etc.) aimed at measuring or representing an individual's knowledge, skills, abilities, capacity to learn, performance, personality characteristics, or other characteristics relevant to whether/how a person is deployed or deployable in a human resource role.
- A numerical standard against which an actual test or evaluation result is compared.
- The statistical correlation between a standard and evidence or between two pieces of evidence. For instance, a screening process might assign a "score" based on the correlation of facts claimed by an applicant and the result of a process to verify those facts.

Problem Statement:[8]

"Score" is a data type used in at least a dozen contexts within the HR-XML Library. Organizations such as the Postsecondary Electronic Standards Council (PESC.org), among other learning and education standards organizations include a Score data type definition within their standards. Broadly speaking there is much similarity in design and in the recognition in a need for such a data type, but no uniform practice among and between standards organizations. Nor is a Score data type currently available within the UN/CEFACT Core Data Type Catalogue. The addition of a Score data type to the CDT will provide a basis for more uniform treatment of this key data type across different HR, learning, and education standards organizations.

Relevant Remarks

Assumptions:[9]

Scheme:

A score adheres to a "scheme," which is a statistical or grading convention with respect to how the score is calculated and what the score represents. A scheme identifier uniquely distinguishes the particular scheme used in expressing a score. Below are some of the characteristics of "scoring schemes":

- A scheme may be based upon well-known and generally recognized statistical and mathematical principles. Examples of such schemes are Percentile, Stanine, and standard score (so-called "z-score").
- Schemes range from the complex and formal to the simple and ad hoc (a five point rating scale with corresponding definitions).
- A scheme may be designated and controlled by a particular agency or organization. Such schemes may be in the public domain or may be proprietary.
- Scoring schemes may be generic in nature (applicable to a variety types of tests or evaluations) or they may be specific to a particular test. For example, The Test of Written English® is scored on a six-point scale rounded to the nearest half-point increment. The highest possible score is 6. The lowest is 0. The increment is ".5". Thus, valid scores are 6.0, 5.5, 5.0, 4.5, 4.0, 3.5, 3.0, 2.5, 2.0, 1.5, 1, 0.5, and 0.

Facets:

Ideally, the definition of a score scheme should not have to be communicated within business transactions. It is desirable for trading partners to agree upon score schemes out-of-band so that score schemes can be readily be known and interpreted with merely the communication of a scheme identifier.

However, in certain cases, additional metadata may be necessary or desirable to appropriately interpret a scoring scheme. This may be particularly useful in the case of a scheme that is not generic, well-known, or customary, but is tied to a particular test or evaluation type. In such cases, it is common to communicate metadata such as the minimum and maximum scores allowed by the scheme and the numeric increment or interval in which scores are expressed.

Example: For The Test of Written English® the minimum score is "0", the maximum is "6", and the inter-

val is ".5".

Options:[10]

Use of Measure. Type: the "Unit Code" facet associated with a Measure does not seem adequate to describe the "scoring scheme" semantics introduced above.

Conclusions:[11]

This submission has the characteristics required for a distinct Core Data Type to be created:

- A new business meaningful type of BCC/BBIE can be identified. The 'Score' BCC/BBIE's can be defined as sharing common base business semantics.
- It is possible to assign to this type a Representation Term that is distinct from other RT's. This RT reflects general day-to-day business naming practices.
    - There is some variations among names used to describe "scores". "Grade" and "Mark" are common alternative terms. However, the proposed name "Score" is consistent with the definition within the Oxford English Dictionary. Groups like PESC.org also use the term score in a manner that is consistent with this proposal – the exception being that their current score data type allows for both numeric and non-numeric values. In making a decision with respect to this proposal, it may be worthwhile to discuss names for non-numeric score-like values. HR-XML's current model uses the term "Mark" to refer to these non-numeric values similar in purpose to scores. This usage is generally consistent with definitions within the OED. Perhaps another solution might be to use the term "ScoreFormat" to refer to a value that may have a purpose similar to a numeric score, but may not be presented as a numeric.

- It is possible to clearly describe the usage of the new type/RT in contrast with other types/RT's.
    - No other type covers this usage so far.
- The new type has a structure that differs from other Data Types and cannot be derived from an existing type:
    - It is similar to Identifier. Type in that it is characterized by a scheme, but it takes numeric values
    - It is similar to Measure. Type in that it takes numeric values, but it is characterized by a scheme rather than by a unit code.

Diagram and Examples

Structure:[12]

Permissible primitives: decimal, integer

(Warning: 'interval' facet needs to be added to numeric primitives)

Supplementary components: none (the scheme and facets values are specified by the meta-model at design time)

Below are just a few examples of related BIEs within the HR-XML Version 3.0 draft.

Example BIES:[13]	**Object Class**	**Property**	**Representation**
A minimum level of proficiency for a competency associated with a position (or role, course, or other item).	Position	Required_ Proficiency	Score
Behavioral indicators are the observable activities of an individual who possesses or who is demonstrating an associated competency. In performance management processes, raters	Competency	Autonomy_ Indicator	Score

often are asked to evaluate specific "behavioral indicators" of a competency rather than whether an individual processes the competency itself. Observable means that one can either see or hear behavior indicating a competency. For behavioral indicators to be meaningful, they should be sufficiently defined and statistically and logically correlated with the associated competency. For example, when an employee is demonstrating "initiative" as a competency, among the behaviors one might observe might be the individual independently seeking information from various sources to inform a decision or solve a problem.			
A high-level or summary result for an assessment or appraisal. Can include a calculated result from component scores. For example, a weighted average of component scores.	Assessment	Overall_ Result	Score

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Evaluation

Urgency of Standardization:[14]	☐ **LOW**	☐ **MEDIUM**	**X HIGH**
Estimated Standardization Date:[15]	dd-mmm-yy		
Reason:[16]			
Already used/implemented:[17]	☐ **YES**	**X PLANNED**	☐ **NO**
If yes or started, where and how:[18]			
Success of Standardization:[19]	☐ **EASY**	**X MEDIUM**	☐ **HARD**
Description:[20]			

[1] *Responsible person / expert of contribution of new CDT (mandatory)*
[2] *Date of contribution (mandatory)*
[3] *Standard Organization that requires the new CDT (mandatory)*
[4] *Group or project team that needs the new CDT (mandatory)*
[5] *Dictionary entry name of the new CDT (mandatory)*
[6] *Write one sentence for identification of the issue – i.e. New supplementary component for coded representation of time zones. (mandatory)*
[7] *Write a short summary or even definition of the new or extended (modified) CDT, usually no more than 3-4 sentences*
[8] *Define a more detailed explanation of the issue, to include the use case for the issue. The contributor has to describe the business specific reason of the new CDT or extension. This must included a clear and substantial list of arguments, why this new CDT or extension is absolutely required. These arguments should only focus on the requirements in business oriented view (BOV), and shouldn't describe, why the CDT is required for technical specific reasons (FSV).Does not include any assumptions on the proper solution. (mandatory)*
[9] *Describe any assumptions related to the issue in terms of limitations, existing requirements, overall CEFACT position on the role of schema. Please explain, if any possible impacts and next steps, if this issue will be not standardized. (mandatory)*
[10] *Describe a detailed explanation and analysis of each of the options. Make sure that the explanation is from both a technical and business case. There should be code supporting each option. If there is already a CEFACT solution that should always be the first option. Each option should be discussed in objective terms, with pros and cons provided independent of the Authors personal perspective or desires. It could be also possible to describe possible backups or workarounds that is based on existing CDTs or even via ACC/ABIEs, if this CDT will be not standardized. (optional)*
[11] *A discussion on the conclusions reached based on an analysis of the options in terms of both the business case identified in the problem statement and the requirements of UN/CEFACT. (mandatory)*
[12] *Diagram or structure of the new CDT or that represents the extension of an existing CDT. It includes the content component, 1 or more supplementary components, the built-in types, necessary identifier schemes and possible code lists. The detailed structure could be done by the CDT specific template. (optional)*
[13] *Show some valid examples of BBIEs that are based on the new CDT. (optional)*
[14] *The contributor has to define the urgency of the standardization of the new CDT (optional):*
- *LOW means, it is not so urgent to standardize, because the project plan gives enough time ore even an existing solution is quite usable . It cold be possible to consider the new CDT in a later version.*
- *MEDIUM means that the new CDT should be standardized in the next release of standard.*
- *URGENT means the standardization has to make sure that the new CDT will consider it as soon as possible. A fast track standardization effort may be required.*

[15] *Define the estimated standardization date (optional).*
[16] *Explain the reason of urgency in detail (optional).*
[17] *Is the new/extended CDT already used or implemented in any other standard (YES/NO), or it is absolutely planned to use the new/extended (PLANNED). (optional)*
[18] *If the new CDT already used or implemented, please explain in which standard or application (optional)*
[19] *The responsible contributor should approximately evaluate the kind of success of standardization (optional).*
- *EASY means it is quite easy to change the standard according this candidate paper, because other members may be also require the new CDT.*
- *MEDIUM means that more detailed work and analysis is required, because the other members haven't the same business requirements so far.*
- *HARD means, it could be nearby impossible to standardize the new CDT, because the business requirement is not clear or even other users are using different solutions for the same business requirements. But it is a major requirement of the standardization organization of the contributor..*

[20] *Explain the reason of this evaluation (optional).*